

## Contents

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## 1 Routine/Function Prologues

### 1.0.1 getgrad.F90 (Source File: getgrad.F90)

Opens, reads, interpolates and overlays radiation forcing.

TIME1 = most recent past data TIME2 = most recent future data

#### REVISION HISTORY:

```

28 Oct 1999: Brian Cosgrove; Initial code, see getrad.f
27 Apr 2000: Brian Cosgrove' Disabled zenith angle correction cutoff for
              cos(zen) less than .2
11 May 2000: Brian Cosgrove; Enabled correction cutoffs for cos(zen) less
              than .1, stop model if computed value is greater than 1367 w/m2
08 Jan 2001: Brian Cosgrove; Added check to see if czb or czm is equal
              to zero before trying to divide by czm or czb. If it is
              zero, set radiation value to zero
06 Mar 2001: Brian Cosgrove; Changed computation of WT1 and WT2 in cases
              where the previous hour or the next hour of observed radiation
              is not available. Substituted TIME1 for LDAS%PINKTIME1 and
              LDAS%NESTIME1 and TIME2 for LDAS%PINKTIME2 and LDAS%NESTIME2
15 Jun 2001: Urszula Jambor; Reworked algorithm for AGRMET data & GLDAS.
15 Oct 2001: Jesse Meng; Replace lis%agrmet flag by lis%agrmetsw and
              lis%agrmetlw; added call retagrlw() to calculate
              AGRMET LW;
25 Feb 2002: Urszula Jambor; check on both SW & LW file status before
              using
04 Jun 2002: Urszula Jambor; allowed fall back to model SW.
10 Dec 2002: Urszula Jambor; replaced lis%astat1,2 with local sstat1,2
              Reorganized routine to mirror other get-routines, and
              corrected bug in file status check for initial time1.

```

#### INTERFACE:

```
subroutine getgrad
```

#### USES:

```

use lisdrv_module, only : lis, grid
use obsradforcing_module, only : obswdata1,obswdata2,oblwdata1,oblwdata2,&
      sstat1,sstat2,lstat1,lstat2
use time_manager
use time_module
use agrmetdomain_module, only : agrmetdrv

implicit none

```

#### CONTENTS:

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```
!-----  
! Determine Required Observed Radiation Data Times
```

```

!-----
yr1 = lis%t%yr      !Previous Hour
mo1 = lis%t%mo
da1 = lis%t%da
hr1 = lis%t%hr
mn1 = 0
ss1 = 0
ts1 = 0
call tick ( time1, doy1, gmt1, yr1, mo1, da1, hr1, mn1, ss1, ts1 )

yr2 = lis%t%yr      !Next Hour
mo2 = lis%t%mo
da2 = lis%t%da
hr2 = lis%t%hr
mn2 = 0
ss2 = 0
ts2 = 60*60
call tick ( time2, doy2, gmt2, yr2, mo2, da2, hr2, mn2, ss2, ts2 )

lis%f%findagrtime1=0
lis%f%findagrtime2=0
movetime=0

if(lis%t%time.ge.agrmetdrv%agrmttime2) then
  movetime=1
  lis%f%findagrtime2=1
endif

if(get_nstep()==0 .or.get_nstep()==1) then
  lis%f%findagrtime1=1
  lis%f%findagrtime2=1
  movetime=0
endif

if (lis%f%findagrtime1==1) then
  call agrSWfile ( nameSH, lis, yr1, mo1, da1, hr1 )
  print*, 'calling swfile.. ',nameSH
  sstat1 = 0
  call retglbSW ( 1, nameSH, sstat1, 1 )
  lstat1 = 0
  call retagrlw ( 1, yr1, mo1, da1, hr1, lstat1, 1 )
  if ((sstat1 + lstat1) < 2) then
    sstat1 = 0
    lstat1 = 0
  end if
  if (sstat1 /= 0) agrmetdrv%agrmttime1 = time1
endif
if(movetime.eq.1) then

```

```

agrmetdrv%agrmtimel = agrmetdrv%agrmtime2
sstat1 = sstat2
lstat1 = lstat2
do c=1, lis%d%ngrid
    obswdata1(c) = obswdata2(c)
    oblwdatal(c) = oblwdatal(c)
end do
endif

if(lis%f%findagrtimel.eq.1) then
    call agrSWfile ( nameSH, lis, yr2, mo2, da2, hr2 )
    sstat2 = 0
    call retglbSW ( 2, nameSH, sstat2, 1 )
    lstat2 = 0
    call retagrlw ( 2, yr2, mo2, da2, hr2, lstat2, 1 )
    if ((sstat2 + lstat2) < 2) then
        sstat2 = 0
        lstat2 = 0
    end if
    if (sstat2 /= 0) agrmetdrv%agrmtimel = time2
endif
!-----
! Print out Status of data holdings
!-----
if (lis%t%time == timel) then
    if (sstat1==0) write(79,*) 'NO AGR SW USED',mo1,da1,yr1,hr1
    if (sstat1/=0) write(79,*) 'USED AGRMET SW',mo1,da1,yr1,hr1
    if (sstat2==0) write(79,*) 'NO AGR LW USED',mo2,da2,yr2,hr2
    if (sstat2/=0) write(79,*) 'USED AGRMET LW',mo2,da2,yr2,hr2

    if (lstat1==0) write(79,*) 'NO AGR LW USED',mo1,da1,yr1,hr1
    if (lstat1/=0) write(79,*) 'USED AGRMET LW',mo1,da1,yr1,hr1
    if (lstat2==0) write(79,*) 'NO AGR LW USED',mo2,da2,yr2,hr2
    if (lstat2/=0) write(79,*) 'USED AGRMET LW',mo2,da2,yr2,hr2
endif
return

```

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### 1.0.2 agrSWfile: (Source File: getgrad.F90)

This subroutine puts together the radiation data filenames.

#### REVISION HISTORY:

28 Oct 1999:	Brian Cosgrove;	Initial code
18 Jun 2001:	Urszula Jambor;	Modified for AGRMET data use in GLDAS
24 Oct 2001:	Jesse Meng;	Modified for AGRMET directory structure

15 Aug 2003: Sujay Kumar: Modified to create a global filename instead of two filenames for each hemisphere.

#### INTERFACE:

```
subroutine agrSWfile ( nameSH, lis, yr, mo, da, hr )
```

#### USES:

```
use lis_module
use agrmetdomain_module, only : agrmetdrv
```

#### CONTENTS:

```
92 format (80a1)
93 format (a80)
94 format (a5, i4, i2, i2, i2)
95 format (15a1)
96 format (a40)
97 format (a1)
98 format (a6, i4, i2, a1)
99 format (13a1)

open(unit=81, file='temp', form='formatted', access='direct', recl=80)
write(81,96,rec=1) agrmetdrv%agrmetdir
read(81,92,rec=1) (fbase(i), i=1,80)

write(81,98,REC=1) '/SWDN/' ,yr,mo,'/
read(81,99,rec=1) fdir
do i = 1, 13
  if ( fdir(i) == ' ') fdir(i) = '0'
end do
write(81,94,rec=1) 'swdn_', yr, mo, da, hr
read(81,95,rec=1) ftime
do i = 1, 15
  if ( ftime(i) == ' ') ftime(i) = '0'
end do
c = 0
do i = 1, 80
  if ( (fbase(i) == ' ') .and. (c == 0) ) c = i-1
end do

write(81, 92, rec=1) (fbase(i),i=1,c), (fdir(i),i=1,13), &
(ftime(i),i=1,15)
read(81, 93, rec=1) nameSH
close(81)

return
```